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Bone Coral

Pictured here is coral from the sea which has been used in orthopedic/dental implant applications.

Corals (class Anthozoa), which include sea anemones (order Actiniaria), are gastrovascular marine cnidarians (phylum Cnidaria) existing as small sea anemone-likepolyps, typically forming colonies of many individuals. The group includes the important reef builders known as hermatypic corals, found in tropical oceans, and belonging to the subclass Zoantharia of order Scleractinia (formerly Madreporaria). The latter are also known as *stony corals* in as much as the living tissue thinly covers a skeleton composed of calcium carbonate. A coral "head" is formed of many individual polyps, each polyp only a few millimeters in diameter. The colony of polyps function essentially as a single organism by sharing nutrients via a well developed gastrovascular network, and the polyps are clones, each having the same genetic structure. Each polyp generation grows on the skeletal remains of previous generations, forming a structure that has a shape characteristic of the species, but subject to environmental influences.

Coral skeletons can be transformed into hydroxylapatite by high temperatures; their porous structure allows relatively rapid ingrowth at the expense of initial mechanical strength. The high temperature also burns away any organic molecules such as proteins, preventing host vs. graft disease. Some modern dental implants are coated with hydroxylapatite. It has been suggested that this may promote osseointegration, but there is not yet conclusive clinical proof of this.

[Obtained in part from http://en.wikipedia.org/wiki/Coral and http://en.wikipedia.org/wiki/Hydroxylapatite - students/learners can click on this to read more]